UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

FEDERAL HOUSING FINANCE AGENCY, AS CONSERVATOR FOR THE FEDERAL NATIONAL MORTGAGE ASSOCIATION AND THE FEDERAL HOME LOAN MORTGAGE CORPORATION, Plaintiff, -against- NOMURA HOLDING AMERICA, INC.; NOMURA ASSET ACCEPTANCE CORPORATION; NOMURA HOME EQUITY LOAN, INC.; NOMURA CREDIT & CAPITAL, INC.; NOMURA SECURITIES INTERNATIONAL, INC.; RBS SECURITIES INC. (f/k/a GREENWICH CAPITAL MARKETS, INC.); DAVID FINDLAY; JOHN MCCARTHY; JOHN P. GRAHAM; NATHAN GORIN; and DANTE LAROCCA, Defendants.	**11 Civ. 6201 (DLC)**

PLAINTIFF'S MEMORANDUM OF LAW IN OPPOSITION TO DEFENDANTS' MOTION TO EXCLUDE CERTAIN TESTIMONY OF CHARLES D. COWAN, PH.D.

QUINN EMANUEL URQUHART & SULLIVAN, LLP

Philippe Z. Selendy
Manisha M. Sheth
Nicholas F. Joseph
Calli Ray

51 Madison Avenue, 22nd Floor
New York, New York 10010
(212) 849-7000

Attorneys for Plaintiff Federal Housing Finance Agency, as Conservator for Fannie Mae and Freddie Mac

TABLE OF CONTENTS

Page

TABLE OF AUTHORITIES

Page

Cases

Statutes

Plaintiff Federal Housing Finance Agency ("FHFA"), as Conservator for the Federal National Mortgage Association ("Fannie Mae") and the Federal Home Loan Mortgage Corporation ("Freddie Mac" and, together with Fannie Mae, the "GSEs"), respectfully submits this memorandum of law in opposition to Defendants' Motion to Exclude Certain Testimony of Charles D. Cowan, Ph.D. ("Motion").[1]

PRELIMINARY STATEMENT

This Court has already accepted Dr. Cowan's sample design. Defendants' narrow challenge here relates solely to certain of the extrapolations Dr. Cowan performed of sample analyses by Dr. John Kilpatrick, FHFA's appraisal expert. Defendants do not contest Dr. Cowan's extrapolation methods or his calculations. Instead, their motion questions the confidence levels as to two tables and one accompanying chart – a total of two extrapolations out of the 43 Dr. Cowan performed – that use the automated value model ("AVM") results from Dr. Kilpatrick to assess the truthfulness of statements Defendants made about the loan-to-value ratios ("LTVs") of the mortgage loans in the Supporting Loan Groups ("SLGs").

Defendants' proffered statistician, Dr. Arnold Barnett, does not assert any error by Dr. Cowan in the two challenged extrapolations, but instead merely performs calculations requested by defense counsel. There is a good reason for this: Defendants' arguments depend on a basic misunderstanding of statistics, and, to boot, are internally inconsistent.

First, Defendants wrongly charge Dr. Cowan with a failure to measure his extrapolations of average LTV inflation at a 95% confidence level on the basis that his analysis does not exclude from consideration those AVM data results that, individually, are not statistically significant at a 95% confidence level. This argument confuses the measurement of precision of

[1] Abbreviations used in this memorandum and not otherwise defined herein refer to the abbreviations from the Table of Abbreviations set forth in Defendants' Motion, except that references to "Ex." refer to exhibits to the January 23, 2015 Declaration of Nicholas F. Joseph submitted in opposition to Defendants' Motion. References to "Def. Ex." refer to those exhibits to the January 8, 2015 Declaration of Elizabeth Cassady.

an *output*, Dr. Cowan's extrapolation to the population, with a test of statistical significance of the precision of individual *inputs* to that calculation, here the loan-specific AVM data generated by the Greenfield model. Dr. Cowan reports his extrapolations, *in the aggregate*, at 95% confidence, and that is exactly correct – thus showing the reliability of the extrapolations in representing characteristics of the population (such as the general level of inflated values shown by the AVM data). The validity of the statistical extrapolation is distinct from the question of the validity or variability associated with each AVM data point, which is a separate function dependent upon the attributes of Dr. Kilpatrick's model. Dr. Cowan does not offer opinions as to the statistical significance of each AVM data point for specific loans, taken individually, and it is fundamental error for Defendants to conflate the two issues. Indeed, Defendants' methodological error conflicts with basic tenets of statistics.

Second, Defendants argue that, when extrapolating AVM results to assess the extent of Defendants' misreporting of LTVs (as reflected in Dr. Cowan's table showing migration between LTV levels), Dr. Cowan should have excluded from his sample any AVM result less than one standard deviation from Defendants' reported LTV – again assessed with respect to each loan individually – on the basis that Dr. Kilpatrick uses such a test. This argument betrays multiple errors. To begin with, it repeats Defendants' misunderstanding of the difference between the statistical validity of an extrapolation and that of an input to the extrapolation. Further, it ignores Dr. Kilpatrick's testimony that he uses this measure not as a validity test but instead for the limited purpose of identifying a subset of appraisals on which to perform credibility assessments. Finally, Defendants' second argument is inconsistent with their first argument in this motion, which would cut off AVM inputs that do not individually meet a 95% level of statistical significance. A one standard deviation limit is equivalent to a 68% confidence level for a normal distribution (applicable here), as made plain in any introductory text of statistics. Thus Defendants contradict themselves by arguing, at the same time, that Dr. Cowan's LTV extrapolations should exclude from consideration individual AVM results based on (1) a

confidence level of 95% and (2) a confidence level of 68%. There could hardly be a better illustration that Defendants do not know what they are talking about.

Because Defendants' challenges to Dr. Cowan's two charts (and accompanying table) are premised entirely on fundamental mistakes in statistical understanding, their motion to exclude Dr. Cowan's related testimony should be denied.

FACTUAL BACKGROUND

In 2012, FHFA sought, and this Court allowed, an early determination of whether proof by means of statistical sampling was admissible under *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993). As part of its submission, FHFA included an expert report from Dr. Cowan describing his methodology. Dr. Cowan there defined certain statistical concepts relevant to providing estimates for a population based on results from a sample drawn from that population. A confidence level, he explained, "refers to the percentage of time that the actual value *for the population* will be within a specified range around the sample value," while the margin of error "refers to that specified range around the estimated value from the sample." Cowan Sampling Report ¶ 33 (Def. Ex. 2) (emphasis added). Together, the sample estimate and the margin of error at a confidence level create a range of values known as the confidence interval. *Id.* If the results from re-underwriting show that 50% of the loans breached underwriting guidelines and the margin of error at the 95% confidence level is +/- 10%, then the confidence interval for the number of loans in the population that breach underwriting guidelines is 40% to 60%, with 95% certainty that the true value for the population is within that range. *Id.*

Dr. Cowan explained that the sample design "will enable FHFA [through extrapolation] to estimate, *per Population*, at a 95 percent confidence level with a margin of error of at most plus or minus 10 percent, the percentage of loans as to which the Prospectus Supplements contained false statements, *e.g.*, based on representations as to owner occupancy, LTV, and/or compliance with a specific originator's underwriting guidelines." *Id.* ¶ 28 (emphasis added). He made clear that these confidence levels related to extrapolation of loan characteristics at the

population level, and not to specific, individual loans. *See id.* ¶ 49 ("The sample size of 100 loans is sufficient to allow, *for each Population*, the computation of an estimate of different binomial (two category, such as defective or not) statistics with a reliability characterized by a 95 percent confidence level with a maximum margin of error of +/- 10 percent.") (emphasis added).[2] Dr. Cowan added that he would choose the proper method of extrapolation once he had the results from the analyses of the samples, in order to minimize the margin of error. "The actual method to be used depends on the availability of data and the relationships between the variables in the sample." *Id.* ¶ 63. This Court held that Dr. Cowan's sample design satisfied *Daubert*. *FHFA v. JPMorgan Chase & Co.*, 2012 WL 6000885 (S.D.N.Y. Dec. 3, 2012) (denying motion to exclude FHFA's sampling methodology).

Robert W. Hunter subsequently performed his re-underwriting, and Dr. John A. Kilpatrick his appraisal analyses, on the samples selected by Dr. Cowan from the seven Nomura SLGs at issue. These analyses were disclosed in expert reports.

Dr. Kilpatrick performed two analyses that are relevant here. *First*, he ran an Automated Valuation Model ("AVM") on the properties underlying the mortgage loans in the samples. This produced an AVM value (known as a point estimate, the most likely value for the property per the AVM) for properties in the sample; in many cases, the AVM value differed from the reported appraised value. For each value produced,[3] the AVM generated upper and lower confidence bounds around the value at a 95% confidence level. Cowan Extrapolation Report (Def. Ex. 1) ¶ 21. Those bounds are a measure of the precision of each AVM value, similar to a confidence interval around an extrapolated population value from a sample: The larger the confidence interval, or the greater the distance between the AVM upper and lower bounds, the less precise (or the more variable) the result. Declaration of Charles D. Cowan, Ph. D. in Opposition to

---

[2] Subsequent to this Court's decision on the *Daubert* motion, Dr. Cowan supplemented his samples to achieve his targeted margin of error at the 95% confidence interval on a supporting loan group ("SLG") basis. Cowan Extrapolation Report ¶¶ 3-4.

[3] The AVM did not always produce a value. Cowan Extrapolation Report ¶ 19.

Defendants' Motion dated January 23, 2015 ("Cowan Decl.") ¶ 4. Thus, Dr. Cowan's extrapolation confidence intervals and Dr. Kilpatrick's upper and lower AVM bounds express, respectively, the variability of the sample and the variability of each AVM value. *Id.* Each AVM value has a unique set of upper and lower confidence bounds, and some AVM results are, for various reasons, more precise (or less variable) than others, judged on the distance between these bounds. October 6, 2014 Expert Report of John A. Kilpatrick, Ph.D. ("October 6 Kilpatrick Report") (Ex. 7) at 3. There is a critical difference between these two measurements of variability: the upper and lower confidence bounds for the AVM results are for each individual *loan*, which is an *input* into Dr. Cowan's extrapolations, whereas the confidence intervals for the extrapolated values are for the *population*, which is the *output* of Dr. Cowan's extrapolations. Cowan Decl. ¶ 5.

Second, where the appraised value for a given loan was at least one standard deviation above the AVM value (measured along the upper confidence bound of each AVM measurement), Dr. Kilpatrick tested the appraisal for compliance with applicable appraisal standards using the Greenfield Credibility Assessment Model (CAM). Cowan Extrapolation Report ¶ 34. For ease of reference, Dr. Kilpatrick defined those properties with such a difference between the appraised and AVM values as "inflated." *Id.* Whether an appraisal was "inflated," by this definition, was an individual inquiry as to the difference between the AVM and appraised values. *Id.* While the difference between two values measured in this way can be used to test statistical significance, Cowan Decl. ¶ 7, that is not Dr. Kilpatrick's purpose; instead, he uses the difference as a gating threshold to determine which individual appraisals should be subject to further assessment using CAM.[4]

---

[4] *See* Deposition of John A. Kilpatrick, taken June 30, 2014 in *FHFA v. Goldman, Sachs & Co.*, No. 11 Civ. 6198 (S.D.N.Y.) ("June 30 Kilpatrick Deposition") (Ex. 1) 46:17-25 ("Q: Why did you need to create a forecast standard deviation for the entire model?" "A: Now, that just gives me an input into my measure of credibility. In other words, that's just the entrance ramp, if you will, into the credibility analysis…. But that measure of forecast standard deviation allows me to have the starting point for my credibility assessment."); Cowan Deposition (Ex. 2) 226:7-20 ("Q: If the loan tape appraised value is outside of the confidence interval for this loan,

Dr. Cowan extrapolated Mr. Hunter's and Dr. Kilpatrick's results from the relevant samples to the SLG populations. In extrapolating AVM results, Dr. Cowan employed a Monte Carlo simulation. The reason he did so was take proper account of the two distinct sources of data variability: variability associated with use of a sample, which is expressed through the confidence interval (reflecting that different samples from the population may produce different values), and model variability associated with the AVM, expressed by the upper and lower bounds associated with each AVM value. Cowan Extrapolation Report ¶¶ 21-23.

The separate confidence interval around each resulting AVM extrapolation thus addressed both the confidence interval associated with sampling and the variability expressed by the upper and lower bounds for each AVM result. *Id.* ¶¶ 23, 26. The Monte Carlo simulation worked by creating new samples at random (to account for sampling variability) and choosing AVM values between the upper and lower confidence bounds at random (to account for variability from the AVM). *Id.* ¶¶ 26-29. The simulation varied the samples and the AVM values a very large number of times (here, 1,000 runs for each SLG), and the distributions allowed Dr. Cowan to calculate an extrapolated AVM estimate with a 95% confidence level that takes into account the sampling and AVM variability *together*. *Id.*

Dr. Cowan performed four analyses of AVM extrapolations based upon a recalculation of LTV ratios using the AVM values (the "Recalculated LTVs"). *Id.* ¶ 31. *First*, he calculated an average loan-to-value (LTV) inflation rate for each SLG, judged against the average LTV reported by Defendants in their offering materials and in the loan tapes (the "Reported LTVs"), as reflected in Table 6 of his Extrapolation Report. Cowan Extrapolation Report at 14 tbl. 6.

---

then you would conclude that the loan appraisal value was inflated, is that right?" "A: Well, first of all, we're back to Dr. Kilpatrick's definition. And secondly, I think you guys are making too much of the terminology about 'inflated.' As I understood it, Dr. Kilpatrick defined a subset that he called 'inflated,' so that he could go off and do the credible check…It's just a mechanism that Dr. Kilpatrick used so that he could winnow down to a smaller set of loans to do the credible review on.").

Second, Dr. Cowan determined the percentages of individual loans, for each SLG, where the Reported LTV was less than the 95% lower bound of the Recalculated LTV ratio, as reflected in Table 7. *Id.* at 14 tbl. 7. In his deposition, he explained this comparison was a standard test of statistical significance. Cowan Deposition at 231:12-17. A test of statistical significance assesses the probability that, for example, the difference between two variables is the result of chance (known as the null hypothesis). Cowan Decl. ¶ 7. Where a difference is statistically significant, it means that it is highly unlikely to be the result of chance. *Id.* Dr. Cowan testified in his deposition that where a Reported LTV for an individual loan was below the 95% confidence bound of the Recalculated LTV, the result was highly unlikely to be caused by chance and thus "statistically significant" even at the loan level.[5] Cowan Deposition at 231:12-17.

Third, Dr. Cowan compared the distribution of Recalculated LTVs to the LTV distributions found on the loan tapes and reported in the Prospectus Supplements. Cowan Extrapolation Report ¶ 32. This comparison is reflected in Table 8 and Chart 1. *Id.* at 15 tbl. 8, chart 1. In recalculating the LTVs using the AVM value, Dr. Cowan followed the practice described by Dr. Kilpatrick: he divided the original principal balance of the loan by the minimum of the original appraisal value, the sale price, or the AVM value. November 13, 2014 Deposition of John A. Kilpatrick in this Action ("November 13 Kilpatrick Deposition") (Ex. 3) at 177:5-178:16. Although not calculated for the purposes of the report, there are margins of error at the 95% confidence level for these extrapolations, which can readily be determined from Dr. Cowan's back-up materials. Cowan Decl. ¶ 8. Each of these results takes into account both the sampling and AVM variability in generating a confidence interval for the population.

Fourth, Dr. Cowan extrapolated the percentage of loans with appraisals that Dr. Kilpatrick found were not credible using CAM. Cowan Extrapolation Report ¶¶ 34-38.

---

[5] By contrast, if a Reported LTV is within the bounds of the Recalculated LTV – again at the individual loan level – the prospect of the difference occurring by chance cannot be dismissed with the same confidence. Cowan Decl. ¶ 7.

These extrapolations use Dr. Kilpatrick's definition of "inflated" because they refer to Dr. Kilpatrick's subset of "inflated" loans in each SLG that were tested using the CAM. *Id.*

Defendants' expert Dr. Arnold Barnett submitted a rebuttal report responding to Dr. Cowan's extrapolation report. November 7, 2014 Expert Report of Arnold Barnett, Ph.D ("Barnett Report") (Ex. 4). While noting that some of Dr. Cowan's extrapolations did not employ the definition of "inflated appraisal" used by Dr. Kilpatrick, Dr. Barnett did not question the use of the Monte Carlo simulation *per se*,[6] nor did he suggest any alternatives to the calculations performed by Dr. Cowan. *See* November 14, 2014, Deposition of Arnold Barnett in this Action ("November 14 Barnett Deposition") (Ex. 5) at 24:16-19 ("It was not part of my assignment to consider anything about an affirmative analysis I might have done, so I can't tell you what I would have done differently."). Dr. Barnett's rebuttal report did not recalculate any values, much less the values that now appear in his declaration submitted with Defendants' motion.

ARGUMENT

I. DR. COWAN'S TESTIMONY REGARDING EXTRAPOLATION OF APPRAISAL INFLATION IS RELEVANT AND WILL ASSIST THE FACT FINDER

Reliable testimony of an expert witness is admissible when it "will help the trier of fact to understand the evidence or to determine a fact in issue." Fed. R. Evid. 702; *see Daubert*, 509 U.S. at 592-94. Here, Dr. Cowan's opinions regarding the characteristics of the loans in the populations are directly relevant to the accuracy of statements in the Prospectus Supplements,

[6] July 24, 2014 Deposition of Arnold Barnett in *FHFA v. Goldman, Sachs & Co.*, No. 11 Civ. 6198 (S.D.N.Y.) ("July 24 Barnett Deposition") (Ex. 6) 177-178:24-2 ("What are flaws that you believe are associated with the use of a Monte Carlo simulation?" 178:5-9 "Well, I'm not saying Monte Carlo simulation is inherently an invalid method and as I said in answer to your question, I've used it myself. Certainly I believe those were impeccable uses."). Dr. Barnett's criticisms of Dr. Cowan's extrapolations using the AVM data focused on the formula for calculating LTV, though Dr. Barnett admitted at his deposition that he has no expertise in this area. November 14 Barnett Deposition at 103:15-16 ("I'm not an authority on how LTV ratios should be calculated.").

and "will help the trier of fact" determine whether Nomura's statements in the Prospectus Supplements are false. Fed. R. Evid. 702(a).

II. DR. COWAN'S TESTIMONY RELIABLY APPLIES ACCEPTED STATISTICAL METHODS

Defendants take issue with Table 8 and Chart 1 in the Cowan Extrapolation Report, which show the corrected distribution of LTVs using the AVM values, as compared to the LTVs from Defendants' loan tapes that are presented in the Prospectus Supplements. But Defendants' criticisms are grounded on their mistakes in basic statistical concepts (which, notably, are not endorsed by their own expert, Dr. Barnett, in his accompanying declaration). Once Defendants' mistakes are corrected, there are no further grounds for their motion.

A. Dr. Cowan's Extrapolations Use The Confidence Interval He Proposed In 2012, And There Is No Basis For Estoppel

In Dr. Cowan's original report on methodology, submitted in connection with Defendants' early challenge to sampling, he explained that he selected sample sizes to achieve *for each population* a margin of error of +/- 10% at the 95% confidence level. *See* Cowan Sampling Report ¶ 49 ("The sample size of 100 loans is sufficient to allow, for each Population, the computation of an estimate of different binomial (two category, such as defective or not) statistics with a reliability characterized by a 95 percent confidence level with a maximum margin of error of +/- 10 percent."). He did not opine as to the statistical validity of each *input*, taken individually, that he would use for these extrapolations. Instead, Dr. Cowan properly reported that his sample design was calibrated to produce an extrapolated *output* for each relevant population with a confidence interval of 95% , +/- 10%. This Court approved Dr. Cowan's method. *See FHFA*, 2012 WL 6000885, at *5 ("According to the Report, these samples will enable FHFA to make estimates *regarding the underlying populations* with a 95% confidence level and a margin of error of ± 10%.") (emphasis added).[7]

[7] While Dr. Cowan did not report confidence intervals for Tables 8 and 10, he provided the data necessary to calculate them; in both cases, the confidence intervals were within the target. Cowan Decl. ¶ 8.

1. Defendants Confuse The Margin Of Error For An Extrapolation With The Statistical Significance Of Individual Data Inputs

Defendants err in arguing that Dr. Cowan did not follow his sampling design. Defendants contend that Dr. Cowan "employs simulated values for every loan in the sample—including loans that, by his own admission, did not have understated LTV ratios" when performing the extrapolations reflected in Table 8 and Chart 1. Mem. 7. They then assert – without support from their own expert, Dr. Barnett – that Table 8 and Chart 1 are not consistent with Dr. Cowan's statement that he would measure the margin of error for his extrapolations at the 95% confidence level and that "[b]y using simulated LTV ratios for all of the sample loans, he produces results that have no statistical significance whatsoever." *Id.* at 8. Defendants' error is to confuse the confidence interval for Dr. Cowan's extrapolations with a test for statistical significance at the individual loan level based on the confidence bounds for each AVM result.

Dr. Cowan employed a Monte Carlo simulation (a standard method that Dr. Barnett has also used) to account in his extrapolations for *both* (1) variability in the data created by the use of a sample (rather than an entire population) and (2) variability created by the use of an AVM. Cowan Decl. ¶ 13. Each individual AVM value is an *input* to this calculation. The Monte Carlo simulation allowed Dr. Cowan to report a margin of error at the 95% confidence level for these aggregate calculations that took into account both these sources of variability (from sampling and from the AVM) when measuring the precision of the extrapolation, the *output* of his calculations. Cowan Decl. ¶¶ 3, 13.

In asserting that Dr. Cowan should have discarded any individual AVM value where the difference between the AVM and the reported appraisal value did not pass a test of statistical significance at 95% confidence, Defendants conflate a test of precision of an *input* with a test of precision of an extrapolated *output*. Defendants seek to eliminate valid comparative data on the spurious basis that they vary individually in magnitude, even though they exhibit, when taken together, both *statistically significant* and in fact *material* effects. Thus, the aggregate data show a statistically significant difference between the extrapolation of Recalculated LTVs and the

average Reported LTVs, strongly supporting an inference of widespread appraisal inflation. Contrary to Defendants' unsupported premise, the science of statistics specifically enables drawing extrapolations that are more precise than the individual inputs per the Central Limit Theorem. Cowan Decl. ¶ 14. Thus, as here, an extrapolation may be statistically significant when tested against another aggregate value even though the differences between individual inputs are not statistically significant.

It is possible to measure the statistical significance of the results of a test on an extrapolated value, and doing so here further illustrates Defendants' error. Certain individual AVM values do not differ at a *statistically significant*, 95% confidence level from the appraised values reported by Defendants, even though there are observable differences in the actual data. October 6 Kilpatrick Report at 3-4. But because these differences point generally in the same direction, the differences are meaningful and strongly support the conclusion of appraisal inflation. Specifically, when these individual AVM values from the sample are extrapolated to the population, one can test whether the difference between the *average* reported appraised value and the *average* AVM value is statistically significant. Cowan Decl. ¶ 15. Here, the differences between average Reported LTV and the Average Recalculated LTV in fact are *statistically significant – for every single SLG* – at the *95%* confidence level. *Id.*

2. Defendants Are Wrong To Assert That Dr. Cowan Should Have Excluded Individual AVM Values From His Extrapolation

To perform the extrapolation as Defendants propose – *i.e.*, to exclude from the extrapolation any inflation, as measured by the AVM, that is not statistically significant when measured individually – is fundamentally wrong as a matter of statistics because it ignores relevant data. Cowan Decl. ¶ 16. A simple example illustrates this.

Suppose there is a sample of 100 loans, and every loan has an AVM value with an associated standard deviation of +/-15% at the 95% confidence level. This would mean that the 95% upper confidence bound on each estimate is the AVM value plus 29.4% (using the formulas from Dr. Cowan's Extrapolation Report). *Id.* ¶ 17. Finally, suppose that for every loan in the

sample, the appraisal value is 25% greater than the AVM value, demonstrating an overwhelming trend of appraisal inflation. *Id.* According to Defendants' logic, because the observed differences fall with the 95% bounds, (1) there is no statistically significance difference as to the comparative data for each loan, taken individually, (2) all the data points therefore must be excluded, and (3) one must conclude in the aggregate that there is no appraisal inflation at all – even though, both in average and for all loans, the appraisal is 25% greater than the AVM values. *Id.* Defendants' position is contrary to well-established statistical science, including the Central Limit Theorem mentioned above. *Id.*

Defendants' attempt to discard input data also mistakes what is measured by statistical significance. Specifically, the failure of a statistical significance test of difference of an individual AVM/appraisal comparison – because the Reported LTV is above the 95% lower bound of the Recalculated LTV – does *not* imply either the accuracy of the Reported LTV or that the difference is the result of chance. *Id.* ¶ 18. What it means is simply that one cannot exclude, *at a 95% confidence level* and based on the single comparison, the possibility that the difference is the result of chance. *Id.* More data may increase the level of confidence in the observed difference, demonstrating why input data should *not* be excluded on this basis in an aggregate calculation or extrapolation. *Id.*

It is telling that Dr. Barnett does not repeat Defendants' error in his declaration. All he says is that he performed the calculations Defendants requested. *See* Declaration of Arnold Barnett, Ph.D in Support of Defendants' Motion dated January 8, 2015 ("Barnett Decl.") ¶ 2 ("I have been asked to calculate the distribution of loan-to-value (LTV) ratios across various ranges (e.g., 80 to 85 percent), using Dr. Cowan's methodology but taking into account the statistical significance of his findings for individual loans."). Dr. Barnett does not say that this new calculation is the correct one as a matter of statistics, and he does not question any of Dr. Cowan's calculations. Nor could Dr. Barnett do so consistently with his testimony in this matter. Defendants advocate using the Recalculated LTV in some cases but the Reported LTV

in others, but Dr. Barnett admitted that it cannot be true, at the same time, that the AVM is reliable and that the Reported LTVs are accurate.[8]

3. Judicial Estoppel Does Not Apply

Because Dr. Cowan did exactly what he told this Court he would do, judicial estoppel cannot apply. *Pegram v. Herdrich*, 530 U.S. 211, 227 n.8 (2000). Not only does *Pegram* caution that judicial estoppel must be narrowly applied, but the concept of estoppel has no place with respect to Dr. Cowan's consistent use of well-established statistics in his extrapolations.

B. Dr. Cowan's Extrapolations Are Reliable

"In determining the admissibility of an expert witness's testimony, a court must 'undertake a rigorous examination of the facts on which the expert relies, the method by which the expert draws an opinion from those facts, and how the expert applies the facts and methods to the case at hand.'" *Assured Guar. Mun. Corp. v. Flagstar Bank, FSB*, 920 F. Supp. 2d 475, 502 (S.D.N.Y. 2013). Rule 702 requires that the testimony is based on sufficient facts or data, is the product of reliable principles and methods, and that the expert has reliably applied the principles and methods to the facts of the case. *Id.*; Fed. R. Evid. 702. "[I]n accordance with the liberal admissibility standards of the Federal Rules of Evidence, only serious flaws in reasoning or methodology will warrant exclusion." *In re Fosamax Prods. Liab. Litig.*, 645 F. Supp. 2d 164, 173 (S.D.N.Y. 2009).

As shown in Section II.A, Dr. Cowan properly measured the margin of error for each of his extrapolations at the 95% confidence level. This more than satisfies the reliability requirement of *Daubert*.[9] The statistical significance of certain loan level data, taken

---

[8] Specifically, Dr. Barnett admitted that the data contradict the hypothesis that the AVM is reliable *and* that the Reported LTVs are accurate. November 14 Barnett Deposition 122:12-123:12. One or both of those two statements must be false. *Id.*

[9] FHFA can of course satisfy its burden of proof by preponderance of the evidence through a lesser confidence interval. *E.g., United States v. Hatfield*, 795 F. Supp. 2d 219, 234 (E.D.N.Y. 2011) (where the relevant burden is by preponderance of the evidence, which "does not anywhere near require 95% certainty," a confidence interval smaller than 95% is appropriate); *Fin. Info., Inc. v. Moody's Investors Serv., Inc.*, 1984 WL 2119, at *3 n.1 (S.D.N.Y. Jan. 10, 1984) (to satisfy preponderance of evidence standard, confidence interval can be as

individually, is not the measure of the validity of Dr. Cowan's extrapolations, and Defendants' misuse of such data cannot buttress their motion. Because Dr. Cowan does not opine as to statistical significance for individual loans, he is not required to do so here. Defendants' cases thus miss the mark.[10]

Defendants' own expert does not contend that Dr. Cowan's methodology is unreliable, and does not support the baseless assertions in Defendants' motion. Any criticism by Dr. Barnett now would be untimely, not only because expert discovery closed on November 26, 2014, but also because Defendants cannot raise an issue for the first time on reply.[11] Defendants thus fail to present any evidence – whether expert testimony or otherwise – that Dr. Cowan employed an unsound methodology in the extrapolations challenged here.

C. Dr. Cowan's Extrapolations Comply With Rule 403

For the same reasons set forth above, Dr. Cowan's extrapolations satisfy Federal Rule of Evidence 403. Dr. Cowan's extrapolations are correct as a matter of statistics and would not "confus[e] the issues" even if there were a jury, which there is not. Minute Entry, *FHFA v. Nomura*, 1:11-cv-6201 (DLC) (Jan. 21, 2015). Defendants' argument in Section II.C is baseless.

---

small as 51%). *See also Johnson v. White*, 528 F.2d 1228, 1238 (2d Cir. 1975) (when the sample size required to achieve a high confidence level is too large to be practicable, a smaller confidence level is allowable).

[10] Contrary to Defendants' argument (Mem. 15), *In re AIG Sec. Litig.*, 265 F.R.D. 157 (S.D.N.Y. 2010), *rev'd on other grounds*, 689 F.3d 229 (2012) does not "insist[] on the use of a 95 percent confidence level," nor would such insistence square with statistical science. The case merely holds plaintiff had not demonstrated that it was "consistent with standard methodology in financial economics, or in conducting event studies specifically, to draw conclusions at the 10% [confidence] level." *Id.* at 187. The proper confidence interval depends upon the purpose of the extrapolation. The case of *In re Moody's Corp. Sec. Litig.*, 274 F.R.D. 480, 493 n.11 (S.D.N.Y. 2011) cites *AIG*, but does not support Defendants.

[11] *See* Order, *FHFA v. Nomura*, 1:11-cv-6201 (DLC), Dkt. No. 806 (Sept. 8, 2014); *In re Longtop Fin. Techs. Ltd. Sec. Litig.*, --- F. Supp. 2d ----, 2014 WL 2998524, at *5 (S.D.N.Y. July 3, 2014) (affidavit by an expert submitted after the deadline for expert testimony will be excluded); *Conn. Bar Ass'n v. United States*, 620 F.3d 81, 91 n. 13 (2d Cir. 2010) ("Issues raised for the first time in a reply brief are generally deemed waived.").

III. DR. COWAN WAS CORRECT NOT TO EXCLUDE RELEVANT DATA BY EMPLOYING DR. KILPATRICK'S "INFLATED APPRAISAL" DEFINITION

Defendants repeat their errors, as a matter of basic statistics, in asserting that Dr. Cowan must limit data used in his extrapolations based on Dr. Kilpatrick's definition of "inflated appraisal." Dr. Cowan calculates the average inflation of the Reported LTVs compared to the average Recalculated LTVs in Table 6 of his Extrapolation Report, and makes use of all input data for this purpose. By contrast, Defendants' calculation uses a cut-off of one standard deviation (also known as measurement at 68% confidence in a normal distribution),[12] employed by Dr. Kilpatrick for the separate purpose of deciding which individual appraisals to analyze for compliance with the applicable appraisal standards. Kilpatrick Report at 53-54 (Def. Ex. 3), October 6 Kilpatrick Report at 33. Specifically, where the appraisal was above the upper bound, calculated at 68% confidence, Dr. Kilpatrick subjected that loan to CAM. For ease of reference, Dr. Kilpatrick referred to those appraisals that were above the upper 68% confidence bound generated by his AVM as "inflated," but he made clear that this usage did *not* imply a finding that appraisals below one standard deviation were acceptable.[13]

Dr. Cowan used the "inflated" definition where it was statistically appropriate to do so: in extrapolating the percentage of "inflated" appraisals that Dr. Kilpatrick found were not credible using CAM. But he did not use it when calculating average inflation in Table 6. This test for "inflation" has no application in the context of extrapolation of *average* inflation, for two reasons. *First*, it again confuses the difference between a confidence interval for an extrapolation and statistical significance at the level of an individual result, as described in Section II.A above. Dr. Kilpatrick's test for whether a loan is "inflated" is based on the

---

[12] All tests of significance, including those performed by Defendants, have been based on a normal distribution. Cowan Decl. ¶ 19 n.2.

[13] *See* June 30 Kilpatrick Deposition at 166:25-1672-13 ("I am not suggesting that appraisals below that FSD [one standard deviation] don't have the same kind of credibility problems. And as I testified this morning, I looked at many of them and found that they, too, suffered from many of the same problems. Nonetheless, it's a twofold process. Number one, do they exceed the FSD as established by my AVM. And number two, do they fail the credibility assessment as conducted via my CAM and in the other report.").

comparison of the upper bound generated by the AVM, at 68% confidence, for each individual loan with the related individual appraisal. Cowan Decl. ¶ 20. It has nothing to do with the confidence interval for Dr. Cowan's extrapolations, and to use it to exclude measurements from extrapolation is wrong, as a matter of basic statistics, for the same reasons discussed above in Section II.A.

Second, Defendants' argument here conflicts with their first argument on this same motion. Defendants first assert Dr. Cowan should have used the 95% confidence upper bound, which is approximately *two* standard deviations, as the cut-off for an "inflated" appraisal. Here, they assert Dr. Cowan should have used *one* standard deviation as the cut-off.[14] Thus Defendants are committed, simultaneously, to the contradictory propositions that Dr. Cowan's LTV extrapolations should exclude individual AVM results (1) based on a confidence level of 95% (approximately two standard deviations), and (2) based on a confidence level of 68% (one standard deviation). Cowan Decl. ¶ 21. Both of Defendants' inconsistent propositions are false.

Once again, Defendants' own expert Dr. Barnett does not endorse Defendants' position but only performs the requested calculations. Barnett Decl. ¶¶ 4-5. Dr. Barnett's calculations, however, cannot be squared with his testimony that it cannot be true both that the AVM is reliable and the Reported LTVs are accurate, as discussed in Section II.A.2 *supra*. Defendants' proposed combined calculation of Reported LTVs and Recalculated LTVs is therefore improper here as well.

[14] Defendants' cases are inapposite. Contrary to Defendants' own stance, there is no internal inconsistency or impossibility in Dr. Cowan's position, rendering irrelevant *Hunt v. CNH Am. LLC*, 857 F. Supp. 2d 320, 343-45 (W.D.N.Y. 2012). There is no parallel between Dr. Cowan's use of established statistical science and the suspect methodology in *United States v. Herrera*, 788 F. Supp. 2d 1026 (N.D. Cal. 2011). Dr. Cowan's assertions are grounded in statistics, unlike the expert's work in *Shatkin v. McDonnell Douglas Corp.*, 727 F.2d 202, 208 (2d Cir. 1984).

IV. DEFENDANTS' ARGUMENTS GO TO WEIGHT RATHER THAN ADMISSIBILITY

Defendants' arguments regarding Dr. Cowan's extrapolations are not only baseless but go, at best, only "to the weight, not the admissibility, of the testimony." *Amorgianos v. Nat'l R.R. Passenger Corp.*, 303 F.3d 256, 266-67 (2d Cir. 2002). In *Amorgianos*, the Second Circuit recognized that "[a] minor flaw in an expert's reasoning or a slight modification of an otherwise reliable method will not render an expert's opinion per se inadmissible. The judge should only exclude the evidence if the flaw is large enough that the expert lacks 'good grounds' for his or her conclusions." *Id.* Defendants fail to identify any flaws in Dr. Cowan's 43 extrapolations, even as to the two extrapolations that are the subject of their motion. Given the narrow scope of their criticism, even if their challenge had merit – which it does not – the proper course would not be preclusion but "vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof." *See id.* (quoting *Daubert*, 509 U.S. at 596); *see Hollman v. Taser Int'l Inc.*, 928 F. Supp. 2d 657, 670 (S.D.N.Y. 2013).

There is no ground for exclusion of Dr. Cowan's opinions on this motion.

CONCLUSION

For the reasons stated above, FHFA respectfully requests that the Court deny Defendants' Motion.

DATED: New York, New York
January 23, 2015

QUINN EMANUEL URQUHART & SULLIVAN, LLP

By: /s/ Philippe Z. Selendy
Philippe Z. Selendy
Manisha M. Sheth
Nicholas F. Joseph
Calli Ray

51 Madison Avenue, 22nd Floor
New York, New York 10010-1601
(212) 849-7000

Attorneys for Plaintiff Federal Housing Finance Agency